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PRD 980.594.709

(EIRS)

EXPOSURE INFORMATION REPORT

PONCE CENTER FOR ENVIRONMENTAL CONTROL



BROWNING-FERRIS INDUSTRIES

P.O. BOX 3151 • HOUSTON, TEXAS 77001 • 713/870-8100

August 8, 1985

Mr. Richard Walka, Chief
Solid Waste Branch
United States Environmental Protection Agency
Region II
26 Federal Plaza
New York, New York 10278

Dear Mr. Walka:

Enclosed are two copies of the Exposure Information Report for the CECOS International, Inc. Ponce Facility (USEPA ID # PRD980594709) submitted in accordance with Section 3019 of the 1984 Hazardous and Solid Waste Amendments and 40CFR270.10(j) meant to accompany the facility Part B Application.

Sincerely,

BROWNING-FERRIS INDUSTRIES

Curtis J. Johnson
Divisional Vice President
Environmental Controls

CJJ/lk
Enclosure

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CECOS INTERNATIONAL, INC.

PONCE CENTER FOR ENVIRONMENTAL CONTROL

EXPOSURE INFORMATION REPORT

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ATTACHMENT C	Surface Water Features

PONCE CENTER FOR ENVIRONMENTAL CONTROL
EXPOSURE INFORMATION REPORT

1.0 GENERAL INFORMATION

The following exposure information report on the CECOS International, Inc. Ponce Center for Environmental Control is submitted in compliance with Section 3019 of RCRA as established by the 1984 Hazardous and Solid Waste Amendments (codified in 40 CFR Part 270.10 (j)). A substantial amount of the information required in this report is contained in the RCRA Part B Permit Application submitted to EPA Region II on May 24, 1984.

The Ponce Center for Environmental Control (PCEC), is designed to be a complete waste management facility, including provisions for:

- o secure chemical landfills for hazardous inorganic and organic waste residues (bulk and containerized).
- o sludge dewatering and solidification coupled with wastewater treatment for effective detoxification of contaminated waters.
- o storage of combustible waste liquids that can be blended for off-site disposal.

At the present time, construction of Secure Cell #1 has been halted. The existing sanitary landfill, formerly operated by the city of Ponce, is now operating under CECOS management.

1.1 Facility Location Information

The Ponce Center for Environmental Control is located on Avenue Baramaya, Barrio La Cotorra, in the south central portion of Puerto Rico, approximately one mile outside the city limits of Ponce. The location of the 120 acre site is presented on Figure B-14 in Section B of the RCRA Part B Permit Application, which utilizes the U.S.G.S Topographic Quadrangle for Penuelas, Puerto Rico.

1.1.1 Zoning and Land Use Maps

Figure B-4 in Section B, Volume 1 of the May 1984 Part B Permit Application presents a land use map for the vicinity of the Ponce Center for Environmental Control. There are no zoning restrictions for this area at the present time, as shown on the zoning map for the area, Attachment A. The area in the immediate vicinity of the site is undeveloped and rural in nature. The municipality of Ponce is classified as urban on Figure B-4, and is located approximately one mile east of the Ponce Center for Environmental Control.

1.1.2 Aerial Photograph

Aerial photographs of the Ponce site are included in Volume 1 of the May 1984 Permit application, Section B, Figure B-15 and immediately following the Part A application.

1.2 Waste Analyses

The Ponce Center of Environmental Control has been designed to process a variety of hazardous waste residues. Specific wastes anticipated for receipt at the Ponce facility are itemized in the Part A application submitted in the RCRA Part B Application for the Ponce Center for Environmental Control (Revised May 24, 1984). Although the facility will be capable of accepting a wide variety of waste streams, the following will not be accepted:

- o Hydrophobic Reactives (water reactives)
- o Pyrophoric Reactives (air reactives)
- o Class A Explosives
- o Shock Sensitive
- o Dioxins
- o Radioactive Wastes

1.2.1 Representative Analyses

Currently, the Ponce facility does not accept any RCRA Hazardous Waste for storage, treatment or disposal. Section C of the May 1984 RCRA Part B Permit Application contains the Waste Analysis Plan prepared to fulfill the requirements of 40 CFR Part 270.14(b)(3). This plan details the following:

- o pre-acceptance procedures and waste analysis;
- o on-site inspection, evaluation, testing, and analysis of each waste shipment;

- o on-site waste transfer procedures; and
- o off-site waste shipment procedures.

Prior to approval of any waste material for receipt at the Ponce facility, the generator must provide a representative sample and a detailed physical and chemical characterization of the waste material to a CECOS sales representative. The detailed waste characterization data will include, but will not be limited to:

- o a Waste Characterization Data Sheet (WCD) describing the physical characteristics and chemical composition of the waste;
- o a written description of the sampling method used to obtain the representative waste sample; and
- o a generator certification form which indicates the presence or absence of specific OSHA regulated compounds in the waste material.

The CECOS' Laboratory will examine the representative waste sample, and will review all waste characterization data provided by the generator. Any missing physical and chemical data will be obtained by contacting the waste generator, or by analysis of the waste sample.

Following review of the physical and chemical characteristics of the waste material, the waste will be evaluated for management at the specific facilities which exist at the CECOS Ponce site. This evaluation includes the following items:

- o Receipt of the waste material at the site is in compliance with internal policies and all applicable Federal and Local regulations.
- o The waste material can be satisfactorily managed by one or more methods which exist at the site.
- o The waste material is compatible with the treatment reagents, other wastes which will typically be present, and with the treatment facility(ies) materials of construction, or that on-site capability exists (e.g. waste segregation) to eliminate incompatibilities.
- o Any by-products of the selected waste management method may be managed by on-site facilities, or by a properly permitted off-site facility.

All such waste evaluation data will be developed from actual testing of the representative waste sample, or from existing published or documented data on the management of such wastes or similar wastes using the same or similar management methods as those which exist at the site.

Following completion of all waste analyses, testing, and evaluation activities, CECOS Central Laboratory will either approve or reject a waste material for receipt and management at the CECOS Ponce site. If a waste is approved for receipt and management, the laboratory will assign a unique waste code to the waste, indicating that the specific waste material analyzed and evaluated has been approved. The laboratory will also provide the site technical manager with copies of all waste analyses, testing and evaluation data obtained for the waste, and will specify which management methods are approved, the approximate unit quantities of treatment reagents required, potential waste to waste, waste to reagent,

or waste to materials of construction incompatibilities which must be eliminated, and other handling precautions which must be observed. This information will be provided on a Pretreatment and Disposal Recommendation Form.

As no wastes have been received for treatment and disposal at the Ponce facility, waste stream specific information is not available.

1.2.2 Analysis of Landfill Leachate

No waste has been placed in the secure chemical management facility (Secure Cell #1). Section D of the May 1984 permit application, details procedures for leachate collection and a description of the anticipated analytical testing program.

1.2.3 Analysis of Surface Impoundment Contents

The Ponce facility does not operate or anticipate the construction or operation of surface impoundments for the treatment, storage, or disposal of hazardous waste.

1.2.4 Waste/Leachate Liner Compatibility Test Results

A liner compatibility study has recently been undertaken to assess the effect of landfill leachate on synthetic membranes. The testing program is currently in progress and being carried out by Recra Research, Inc., for CECOS International. The testing program is based on EPA Test Method 9090 "Compatibility Test for Wastes and Membrane Liners" as modified in negotiations between CECOS International and the U.S. Environmental Protection Agency, Region II.

The experimental design of the present study is as follows:

Samples of both seamed and unseamed portions of 80 mil high density polyethylene (HDPE) liner material will be exposed to leachate from each of five subcells of SCMF 3 at the CECOS Pine Avenue Site. The exposure will be carried out at both 20°C and 50°C and samples will be exposed for 30, 60, 90 and 120 days. An additional set of samples will be immersed in tap water held at 50°C for identical time periods to serve as a high temperature control. This design will produce a total of 11 test conditions - 5 leachates at 2 temperatures plus one control.

Upon completion of this program, results will be forwarded to the regulatory agencies.

1.3 Annual Volume/Pretreatment Processes

The Ponce facility has received no hazardous waste for placement in the landfill, Cell #1.

A detailed discussion of the proposed pretreatment processes to be employed at the Ponce facility is included in Section D of the May 1984 Part B Permit Application. The pretreatment processes will be used to stabilize and solidify inorganic sludges prior to secure landfilling.

1.4 Federal, State, and Local Inspections

1.4.1 Agencies Performing Inspections

Existing sanitary landfill operations and the construction activity completed thus far for the future hazardous waste facility at the Ponce Center for Environmental Control have been inspected by the EPA and the Environmental Quality Board of Puerto Rico. Copies of the results of these inspections are on file in the offices of these agencies. Addresses of the offices are:

Environmental Protection Agency
Avenue Fernandez Juncos 410 Parada 8 1/2
Puerto de Tierra, Puerto Rico

Environmental Quality Board
Calle del Parque esq. Pumarada
Santurce, Puerto Rico 00910

1.4.2 Permits

The Ponce facility will obtain NPDES and air permits required to operate the site. When operations commence reports will be submitted as stated in these permits.

2.0 ENVIRONMENTAL EXPOSURE INFORMATION

2.1 Groundwater

2.1.1 Withdrawal Wells

Attachment B of this report contains a map illustrating the location of known groundwater withdrawal wells in the 3-mile vicinity of the Ponce Facility.

2.1.2 Groundwater Usage Patterns

The usage of groundwater in the vicinity of the site is described in Section E, Item 2.3.1.3, Volume 3 of the May 1984 Part B Permit Application. The number, location and usage of private wells is not documented by the Ponce City Administration. The location map of municipal and industrial wells in the Ponce Facility vicinity is presented as Attachment B. Four of the seven municipal wells nearest the site are not in operation due to poor water quality or improper well installation. The other municipal wells are used to supplement the water supply of the City of Ponce, which is obtained from Lake Garzas in Adjunta. Groundwater is chlorinated and mixed with water pumped to the Penuelas Reservoir (capacity: 20 million gallons). Two local firms operate six industrial production wells, used for plant process water only.

2.1.3 Recharge and Discharge Areas

A description of the site hydrogeology is presented in Section E of Volume 3 of the May 1984 Part B Permit Application.

Groundwater in the Ponce area occurs in three types of materials, namely the Juana Diaz formation, the Ponce Limestone and alluvial fill found in the river basins and in the Coastal Plain. The Juana Diaz and Ponce formations form the hills north and west of the City of Ponce. These hills, which are called the Upper Plains, separate the Island's Central Mountains to the north from the Coastal Plain area to the south.

In a regional sense, the Juana Diaz formation overlies the older and highly tilted Cretaceous and Eocene formations north of Ponce. Overlying the Juana Diaz is the Ponce Limestone. The Ponce Limestone dips southward to where it has been eroded and covered by alluvial material. This regional sequence of formations is interrupted by the presence of two west-northwesterly trending faults traversing through the site area. Here, the older, underlying Juana Diaz formation has been faulted upward to form a "window" of Juana Diaz contacted on the north and south by the younger Ponce formation. This "window" of block-faulted Juana Diaz at the site makes for a unique and complex hydrogeologic setting.

Recharge to the groundwater system in the Ponce area is derived from infiltration of rainfall, which averages about 32 inches per year (U.S. Department of Commerce, 1983, personal communication), return flow of irrigation water, and seepage from streams, canals, and ponds. West of the site, in the Quebrada del Aqua basin, recharge of rain water to the Ponce Limestone is rapid in areas where vertical solution channels exist. The primary zone of recharge for Ponce formation is the Rio Pastillo basin (east of the site), which occurs in the northern margin of the Upper Plains. In areas where the Ponce formation consists predominantly

of mudstones or where the Juana Diaz formation is at the surface, little recharge occurs.

Because the Juana Diaz formation has been displaced upward out of the regional sequence, it would not be expected to be receiving recharge updip from a regional standpoint, such as the Ponce formation which occurs to the north and the south of the "window" of Juana Diaz. Recharge to Juana Diaz, then, would have to come either from infiltrating rainfall at the site or large fault systems which may be acting as conduits. Data on groundwater levels in the area indicate large faults which are crossing the site are probably acting as barriers to groundwater flow rather than conduits for regional flow which only leaves rainfall as a plausible source of recharge.

2.1.4 Subsurface Characteristics

Two geologic formations have been identified and mapped within the property boundaries of the Ponce facility, the Ponce Limestone, and Juana Diaz formations.

Within the waste management area the Ponce Limestone occurs as soft calcareous silts overlain by hard fossiliferous crystalline limestones and interbedded calcarenites and siltstones. The Ponce Limestones is of Miocene age. Joints in these beds are well cemented.

The Juana Diaz formation consists of bedded hard calcarenite and softer calcareous clayey silt underlain by calcareous sandy silts and calcareous clayey silts of variable bed thickness. The Juana Diaz Formation is of mid-Oligocene to Miocene age. Stratigraphically, the Juana Diaz

formation is older than the Ponce formation. The contact between the two formations represents an unconformity.

Within the waste management area, several faults of varying lateral extent have been mapped. The largest of these faults traverse the waste management area in a northwesterly direction. Although an actual fault line is not visible, the stratigraphic relationships across the fault requires roughly 400 feet of vertical offset with the downthrown side to the northeast. Other faults in the area are generally normal, downthrown to the northeast.

The main northwesterly trending faults have resulted in an upthrown block of Juana Diaz formation forming a surface outcrop of older Juana Diaz amongst outcrops of younger Ponce formation. The southwestern property boundary of the site approximates the southern fault contact between Ponce and Juana Diaz formations. The northern fault contact is expressed on-site in the western hills. The upthrown block of Juana Diaz formation is capped by basal Ponce formation.

Faults which cut the Ponce Limestone are Miocene in age or younger. Faults which are truncated by the Ponce Limestone are Miocene age or older. To assess the probable age likelihood of further movement along these faults a survey of geologic investigators who have worked in the Ponce area was conducted. The survey was conducted by Reginald P. Briggs, formerly Project Chief of the USGS Puerto Rico geologic mapping project and now President and Chief Geologist of Geomega, Pittsburgh, Pennsylvania. The consensus of the ten respondents to the survey was that the most recent faulting in the Ponce area is Pliocene to

Pleistocene in age. Also, the possibility of renewed activity within the next few hundred years is very small. A copy of Mr. Briggs' report on age and potential activity of faults in the vicinity of Ponce is included in the Site Characterization Report (SCR)(Appendix 4, Volume 7 of the May 1984 RCRA Permit Application).

2.1.5 Precipitation Data

A discussion of annual and seasonal precipitation for the Ponce facility is presented on pages 49-54 of Section B in Volume 1 of the May 1984 Part B Permit Application. The annual rainfall varies significantly from year to year, averaging approximately 32 inches for the past 30 years in the Ponce vicinity. These figures are greatly different from the northern portions of the island. For Ponce, the hurricane season runs from June through October and may involve up to 40 inches of rain per event.

Evaporation-transpiration rates are discussed on pages 59-62, Section B of the RCRA Permit Application. Field evaporation pan tests were conducted on the Ponce site in August of 1983. Land evaporation rate was found to be 243% of rainfall for August (11.4 inches evaporation/4.69 inches rainfall), while pan evaporation is about 141% of August rainfall (6.6"/4.69").

2.2 Surface Water

2.2.1 Surface Water Bodies

Attachment C illustrates surface water bodies in the general vicinity of the Ponce site. The two major drainage areas within a three mile radius are Quebrada Del Aqua and Rio Pastillo. Both drainage areas are well integrated systems in moderate relief terrain. There are no known surface water intakes located along either drainage area. The limits of the 100 year floodplain are situated approximately 2,000 feet east of the site. These two river systems are ephemeral streams, which are dry river beds most of the year. Water flows along these streams only during periods of heavy rainfall.

The Caribbean Sea is less than three miles south of the site. There are no known designated commercial fishing areas within a three mile radius, however, local non-commercial fishing probably occurs.

2.2.2 Surface Water Velocities

Based upon Attachment C, there are no streams or rivers running through or within 1,000 feet of the Ponce facility. As stated above, the Rio Pastillo and Quebrada del Aqua are ephemeral streams. Thus, velocities are not available for these streams.

2.2.3 Surface Water Monitoring

As described in Item 2.10 of Section B of the RCRA Permit Application, the site is graded to allow segregation of run-off from sanitary and secure landfill operations. Run-off from the sanitary landfills empties into a storm drain and is discharged off-site.

Stormwater from the secure disposal area and process facilities will be transferred to the on-site Wastewater Treatment System for processing. Effluent from this system is discharged to the Solar Evaporation Tank. Operation of the system is described in Section D of the May 1984 RCRA Permit Application.

2.3 Air

Designs for the Wastewater Treatment and Solidification Facilities call for the installation of scrubber systems on all tanks and buildings. Refer to Section D, Volume 3 of the May 1984 Permit Application for details of these venting systems.

2.4 Subsurface Gas

2.4.1 Municipal Waste Disposal

A portion of the facility was operated as a sanitary landfill by the City of Ponce. The sanitary landfill covers 51 acres in the northeast portion of the site. CECOS is continuing operations of this landfill for disposal of municipal wastes, under an agreement with the City of Ponce. No municipal wastes will be placed in the proposed secure cells.

2.4.2 Underground Conduits

The only underground conduits in the vicinity of the Ponce site will be the leachate collection system lines for the secure cells. There are no known underground pipelines connecting the facility to off-site areas.

2.4.3 Monitoring Systems

A gas migration vent system will be installed during closure of each secure cell, (refer to Drawing 1027 in the May 1984 RCRA Permit Application). Gas generation from the secure cells is expected to be minimal, due to the nature of wastes which will be accepted for disposal in these cells.

2.5 Soil

Past disposal practices involving the operation of waste impoundments by SK & F Industries resulted in contamination of soil in an area along the eastern boundary of the Ponce site (refer to Figure E-1, Section E, Volume 3, of the May 1984 RCRA Permit Application). As described in the following paragraphs, the wastes and underlying contaminated soils were removed in accordance with a closure plan submitted to and approved by EPA Region II in 1983 by CECOS International, Inc.

Closure of the SK & F surface impoundments was completed on September 24, 1983. Closure activities involved the complete solidification of the SK & F waste sludge material, excavation of this material along with the impoundment liner and underlying sand layer. All excavated materials were transported to and disposed of at CECOS International, Inc.'s,

Calcasieu facility in Louisiana. Closure of each impoundment unit was accomplished by grading their containment berm into the impoundment and applying one (1) foot of cover material. The cap material used was from the Ponce formation. This material was obtained from a borrow area located on the site.

Concentrations of the chemical constituents of concern within the residual soils underlying the impoundments (except for cyanide and sulfide) did not exceed the established background data. Therefore, with the removal of the SK & F sludge material and liner, the only existing source of potential contamination to groundwater and surface water from past disposal practices at the site is in the underlying soils, which contain slightly elevated levels of cyanide and sulfide.

The potential for this existing material to contribute to surface water contamination is negated due to the capping of the area with material from the Ponce formation. Only through erosion of the cover material can the underlying material potentially contribute to surface water contamination. By maintaining the integrity of the cover material, this potential will not be realized.

The potential of contamination to the underlying groundwater is also limited due to the hydrogeologic conditions at the facility. The hydrogeologic conditions at the site are favorable in that the zone of saturation occurs hundreds of feet below the ground surface in this area. This condition eliminates the potential of groundwater intersecting this material and potentially contaminating the groundwater. Only through migration of infiltrating rainwater through this material does the poten-

tial for contamination of the underlying groundwater exist. Also, groundwater in the area is not suitable for drinking water due to very high dissolved solids content.

The climatic conditions (i.e. evapotranspiration exceeds precipitation) at the site limit the amount of rainfall available to infiltrate into the subsurface. This factor, in addition to the existence of a cover cap over the area, which potentially reduces further the amount of water available to percolate through the underlying soils, and the extreme depths to groundwater limits the potential for the soils with slightly elevated concentrations of cyanide and sulfide to contribute to groundwater contamination.

By maintaining the integrity of the Caliche soil cover, the only potential source for surface and/or groundwater contamination due to past disposal practices within the SK & F impoundments is controlled. Therefore, the remedial activities undertaken during closure at the SK & F impoundments have been completed.

3.0 TRANSPORTATION INFORMATION

3.1 Vehicles and Containers

Once the site becomes operational, bulk shipments of hazardous waste will arrive in dump trailers or roll-off boxes, and flat bed trailers will be utilized for the delivery of containers. All containers and vehicles will comply with DOT standards. It is anticipated that 20 to 30 trucks per day will arrive at the facility.

3.2 Traffic Patterns

As described on Pages 42-45 of Section B, Volume 1 of the May 1984 Permit Application, all vehicles gain access to the site via Route 500. Illustrations of patterns of traffic flow within the facility are presented as Figure B-13 of the May 1984 RCRA Permit Application.

3.3 Spill Prevention and Response Procedures

3.3.1 Unloading Precautions for Tank Trucks

All vehicles will be parked on a level area. There will be an alarm system in the unloading area to immediately signal an emergency situation. The facility personnel will follow the guidelines listed below when unloading tank trucks.

- o Employees will check that the unloading valves are closed tightly before removing caps from unloading connections.
- o All hose or pipe connections will be as tight as possible to prevent spills or leaks.

- o During unloading, pipes and hoses will be protected from traffic movement which could cause breakage or pulling on the lines.
- o Pails will be available in the immediate area to collect dripping or leaks which may develop during unloading.
- o A supply of adsorbent materials, shovels, and open-top drums will be immediately available in the area to respond to minor spills.
- o An employee will be in attendance during the unloading process at all times. This employee will be trained to respond to spill situations.

3.3.2 Unloading Precautions for Drum Shipments

The unloading of drummed materials will occur in the process or secure landfill areas only. The facility personnel will follow the guidelines listed below for drum unloading:

- o The site training program will instruct personnel in the proper methods for unloading drums and hazards involved in improper handling.
- o The fork lift operator will be trained to exercise care in transferring drums to their approved unloading location.
- o A supply of adsorbent materials, shovels, and open-top drums will be immediately available for prompt control, containment, and clean-up of a spill.

3.3.3 Emergency Spill Response

In the unlikely event of a spill, the following plan will be carried out:

- o Immediate action will be taken to contain the spilled material by erection of temporary dikes or booms surrounding the area of the spill, and blocking the flow of materials along ditches.
- o Once the spill is contained, the material will be collected by pumping, shovelling into drums, or by the use of adsorbent materials.
- o All contaminated materials will be disposed of or treated in the appropriate fashion at the Ponce site.

More detailed information is presented in the Contingency Plan, Section G of Volume 6 of the May 1984 Permit Application.

4.0 MANAGEMENT PRACTICE INFORMATION

Facility management practices have been specifically designed to minimize the potential for releases to the environment and exposure to both public and employee populations. Central to these management practices is a thorough understanding by all employees of the means to prevent and control waste releases and to protect themselves from exposure to waste materials. This understanding is based on thorough training.

The CECOS training program for hazardous waste workers is designed to provide general as well as specific orientation to operations. It covers not only the operational, but also the health and safety policies and procedures. The training program also addresses the chemistry and health effects of the exposure to hazardous wastes, the selection, use and care of personal protective equipment, respiratory protection (including respirator fit testing), placarding and labelling, the waste manifest system, decontamination (personal and equipment), contingency plans and high hazard operations. At each facility, an emergency brigade is established which receives specialized training in first aid/CPR, fire suppression and spill control techniques (RCRA training requirements).

Heavy equipment operators receive specialized training in the proper use of the equipment to which they are assigned. In addition to the above, regular safety meetings are held to discuss topical safety concerns (i.e., heat stress during the summer months) and if necessary, to review accidents. "Tool box" on-the-job training is provided for orientation to new processes and/or equipment. New employees are assigned to work with experienced employees during a six-month "break-in" period. Their

knowledge of and compliance with site safety procedures is assessed daily by their supervisor and by the site safety manager during walk-through inspections.

The site contingency plan consists of spill and fire/explosion prevention, control and counter-measure plans. These plans discuss: the potential hazards from spills and fires/explosions, preventive measures, fire and spill response (including equipment, personnel and their responsibilities, interaction with local emergency response agencies - fire, police, hospital, ambulance, etc.), communications procedures and equipment, evacuation procedures, and training and inspections. The contingency plan is presented to site employees as a part of annual RCRA training requirements. The local emergency response agencies are provided copies of the plan and are provided orientation tours to ensure their familiarity with the facility and the operations and to review their role in facility contingency plans.

One indicator of the level of implementation of management practices at a facility is the nature and frequency of injuries. A review of the injury, illness and vehicle accidents data for the CECOS hazardous waste management facilities indicates that illnesses and injuries fall into two broad categories - physical and chemical, with physical injuries being the most prevalent. Chemical injuries have included skin burns, skin and eye irritation, respiratory irritation, allergic reactions and contact dermatitis. These injuries result primarily from unexpected liquid splashes of either contaminated rainwater or leachate or inadvertent contact with chemical materials. The physical injuries have included con-

tusions, lacerations, sprains, pulled muscles, bruises, dislocations and fractures. These injuries result primarily from slips, trips and falls, heavy lifting, drum handling, operation and maintenance of equipment, and vehicle accidents.

Analysis of the frequency and severity of injuries within CECOS and comparison of CECOS performance with that of other companies within the industry is accomplished by relating the number of injuries and days lost to injuries to employee hours worked to produce Frequency and Severity Rates which can then be compared with similiary-derived numbers for the industry as a whole.

The CECOS statistics have shown a steadily decreasing injury Frequency Rate (number of lost time (disabling) injuries per 200,000 hours worked), over the last three years dropping from an average of 8.52 in 1982, to 6.12 in 1984. For the first three quarters of fiscal 1985, the level stands at 5.19, which compares favorably to the level of 16.94 for the refuse industry as a whole (SIC 4953) and the level of 11.4 for the hazardous waste industry (statistics from OSHA Local Emphasis Program on hazardous waste sites as cited in the House of Representatives Committee on Government Operations, May 21, 1985, report titled "OSHA's Failure to Protect the Health and Safety of Workers at Hazardous Waste Sites"). The injury Severity Rate (number of work days lost due to on-the-job injuries per 200,000 hours worked), has gone from an average of 166 over the last 3 years to 122 over the first 3 quarters of fiscal year 1985, (compared to the average of 265 for the refuse industry as a whole).

The frequency and severity of these injuries is below the respective

industry standards due primarily to a comprehensive pro-active company wide occupational health and safety program involving all levels of management. An important feature of this program is the establishment at each facility of joint labor-management "Accident Review Boards" (ARB's). These ARB's have been established to identify causative factors leading to each accident or injury, identify remedial actions necessary to prevent recurrence, assign responsibility, judge preventability, and make recommendations to management. Their purpose is to prevent accidents, eliminate employee suffering and lost time, and to reduce loss costs. Recommendations have resulted in procedural changes, equipment and facilities modifications, training changes, maintenance decisions, new policies, and prevention of the same or similar accidents. Specific actions taken to correct past problems have included: employee retraining, disciplinary action for non-compliance with site safety procedures, and development and enforcement of contractor and visitor policies to allow greater control of non-employees on-site.

On an ongoing basis, CECOS has a comprehensive occupational health program in place with the goal of preventing occupational illness among workers. This program involves the professional disciplines of occupational medicine, industrial hygiene and training in a coordinated approach to identify potentially hazardous exposures, to institute control measures for the protection of workers, to educate workers regarding the hazards involved and proper work procedures, and to monitor worker health.

The employee medical surveillance program requires a physical examination

prior to employment, six months after employment and annually thereafter. Examinations include a comprehensive history and medical evaluation of all appropriate organ systems. Data is generated by qualified independent physicians and entered on computer for ease of retrieval and evaluation. Medical surveillance includes biological testing to evaluate potential exposure.

The Industrial Hygiene program is primarily involved in the evaluation of potential on-site health hazards. The program evaluates potential worker exposure, work practices, use of personal protective equipment, etc., to determine if worker health is being adequately protected. The results of these surveys are fully disclosed to the workers as part of the training designed to instill an understanding by the employee of the interrelationship of their actions, use of personal protective equipment and exposure potential. This is in accordance with the various applicable OSHA standards and the provisions of state and local "Right to Know" laws.

5.0 KNOWN RELEASE INFORMATION

This section of the report is not applicable to the Ponce Facility at the present time, due to the non-operational status of the hazardous waste management facilities.

6.0 EXPOSURE POTENTIAL OF THE UNIT

6.1 Potential for Human Exposure via Groundwater

6.1.1 Site Characteristics

The location of the Ponce facility is such that the potential for human exposure via the groundwater pathway is minimal. This is based upon the quantity of precipitation, the underlying lithologic materials, and the nature of the groundwater resources. For further information regarding hydrogeologic conditions, refer to Section E of the May 1984 RCRA Permit Application. Precipitation is moderate (32 inches per year) and runoff greatly exceeds infiltration. Unsaturated materials underlying the facility have permeabilities on the order of 2×10^{-9} to 9×10^{-9} cm/sec. No groundwater production wells are known to exist in the immediate vicinity or downgradient of the facility. All of these factors contribute to yielding a low potential for human exposure.

6.1.2 Design and Operation Features

A number of features have been incorporated into the design of the facility to aid in minimizing the potential for releases. A detailed description of secure cell design is presented in Section D of the May 1984 RCRA Permit Application. Emphasis in both design and operational planning is to minimize leachate generation and control any leachate that develops. No liquids will be received for disposal in the secure cells. Cover materials will be applied on a daily basis, thus reducing infiltration. Any leachate which may be generated will be collected via a leachate collection system. Leachate is removed from this system

whenever materials are discovered in the system, during daily inspections.

The liner system and the proposed cover have been designed to be continuous over the bottom and side slopes as well as the top of each cell to effectively encapsulate the waste within a layered system that provides for waste containment, leachate collection, and preclude surface water infiltration. The containment materials to be utilized in construction of the barrier system are a combination of synthetic and natural materials. An 80-mil High Density Polyethylene (HDPE) membrane will be the primary barrier. In addition to the membrane, a primary soil barrier has been designed to provide additional leachate containment.

This design was submitted in May 1984, and is in compliance with the requirements 40 CFR Part 264.301. The design of the secure cells will be revised prior to completing construction to meet the requirements for a double liner as mandated by the 1984 Hazardous and Solid Waste Amendments.

The landfill cover will be a system of natural and synthetic liners designed to provide surface run-off and drain precipitation which infiltrates the vegetative layer. A collection system consisting of a 30-mil HDPE synthetic membrane and compacted soil overlain by a sand drainage blanket has been incorporated within the cover. The cover membrane and soil barriers are designed to tie-in with the side liner and provide encapsulation of the waste.

The secure landfill cells will be located in the topographically high southwestern portion of Ponce Waste Facility property. The purposes for siting the secure cells in this area are as follows:

- o The elevated southwestern portion of the site is the primary area containing no previous landfilling. Therefore, selecting this area for the secure landfill operation will allow the most positive separation of past co-disposal landfill operations and the proposed chemical management facility.
- o The southwestern portion of the site is geologically favorable because the underlying materials consist of Juana Diaz Formation soils having a very low permeability in the unsaturated zone.
- o Use of a topographically high area provides an opportunity for leachate collection systems to operate under a gravity flow design rather than relying upon mechanical devices. Pumping can still be used as an effective, supplemental means to aid drainage if necessary.
- o Use of the relatively high topographical area allows easy control of surface water run-on.
- o The elevated topography provides the maximum separation of land-filled waste from regional groundwater flow regimes.

In addition to the specific design features, the use of groundwater monitoring wells will provide a means for timely detection of any releases. Their number and location are such that contamination can be detected

prior to migration of groundwater off the site. Execution of this program in conjunction with the specific design features greatly reduces the potential for human exposure via groundwater.

6.2 Potential for Human Exposure Via Surface Water

6.2.1 Site Characteristics

The Ponce facility is located between two river systems, however the site is topographically isolated from each drainage basin. The Quebrada Del Aqua runs approximately 1500 feet west of the site and the Rio Pastillo is located about 2000 feet east of the Ponce facility. As stated in Section 2.2.1, these stream beds only transport water during periods of heavy rainfall. Thus, the waters are not used for drinking or recreational purposes. Since these streams are dry much of the year, the potential for exposure via this pathway is remote. These rivers drain into the Caribbean Sea approximately 2½ miles south of the site. These river systems have moderately fast flow rates due to the difference in relief in the area, as described in Section 2.2.1.

The potential for exposure via surface water is minimized through the design and implementation of the Stormwater Management Plan, the low potential for spills, and prompt response and clean-up, should a spill occur.

6.2.2 Design and Operation Features

The Ponce Facility has been designed to prevent releases to surface water through the following:

- o All process facilities (drum handling area, tank farms, truck wash, etc.) have been designed with containment systems which have the capacity to hold 100% of the run-off volume of a 24 hour-25 year storm (refer to Section D of the May 1984 RCRA Permit Application).
- o A Stormwater Management Plan (Section B, Item 2.10 of the May 1984 RCRA Permit Application) designed to prevent or minimize run-on to each area of the site and provide for control and treatment of contaminated run-off.
- o High level alarms on all process tanks as described in Section D of the May 1984 RCRA Permit Application.
- o Implementation of the Inspection Plan (Section F of the May 1984 RCRA Permit Application) to detect potential or actual leaks in process areas.
- o Implementation of the Preparedness and Prevention Plan (Section F of the May 1984 RCRA Permit Application) to ensure proper procedures which minimize the potential for releases are followed.
- o All personnel are trained to perform their duties in a manner designed to prevent release as described in the Personnel Training Plan, Section H of the May 1984 RCRA Permit Application.
- o Implementation of the Contingency Plan (Section G of the May 1984 RCRA Permit Application) to respond to site emergencies to minimize the effects of such occurrences.

6.3 Potential for Human Exposure Via Air

6.3.1 Site Characteristics

Land use of the area surrounding the Ponce facility is indicated in the Part B application (Section B, Figure B-4). The area in the immediate vicinity of the site is undeveloped and rural in nature, although there are residences in the immediate vicinity of the sanitary landfill area. The urban municipality of Ponce is located one mile east of the site.

The following table presents population estimates for a five mile radius from the Ponce facility.

<u>Distance From Site (Miles)</u>	<u>Estimated Population</u>
1	10,000
2	60,000
3	95,000
5	120,000

An annual wind rose of meteorological data collected at Ponce is presented in the May 1984 RCRA Permit Application (Section B, Figure B-5). The tradewinds dominate the wind direction in the area. The winds are principally from the northeast and southeast. About 60% of the time the wind blows at a velocity between 4 and 12 miles per hour. As the facility is located in a hurricane-prone area, plans call for shutting down facility operations and application of cover materials prior to such an event. This practice will eliminate the potential for wind-blown dispersal of hazardous constituents.

Operating procedures designed to minimize the effects from a hurricane are described in the Contingency Plan, Section G of the May 1984 RCRA Permit Application.

6.3.2 Design and Operation Features

During construction and operation of the secure landfills, fugitive dust emissions are generated along internal access roads and in the active areas of the landfill. Wind dispersal of particulates is controlled at these times by utilizing water tank trucks to wet the dust producing surfaces. Upon closure of a landfill cell, final cover design calls for a 24 inch thick soil cover to be seeded by a combination of Bermuda/Love grass supplemented with annual rye. Irrigation and fertilization will be provided as necessary. This combination is designed to prevent topsoil erosion and wind dispersion of final cover materials.

A gas migration vent system is included in the design for each secure cell. Venting of the gases will occur through a series of perforated gas vent pipes and risers located within the landfill cover. Risers will be provided in numerous topographically high locations to provide a safe release to the atmosphere.

No bulk disposal of solid wastes utilizing surface impoundments will be practiced at the Ponce Facility.

The Ponce secure landfills to be operated by CECOS have been designed to allow for the disposal of ignitable, reactive and incompatible wastes. Waste materials to be disposed of within the secure area will be solids, in either containerized or bulk form. In order to prevent adverse reac-

tions between waste material components during landfill operations and after closure, waste material segregation will be practiced by subcell and berm segregation and the use of appropriate cover material as described in Section D of the May 1984 RCRA Permit Application.

Wind dispersal effects of the trade winds and the design of the facility and the operational practices of CECOS minimize the potential for human exposure via the air pathway during normal weather conditions. During extreme weather events, operations at the site will be temporarily shut down and cover materials will be placed and compacted over wastes in the secure cell.

6.4 Potential for Human Exposure Via Subsurface Gas

6.4.1 Site Characteristics

There are several characteristics of the location of the Ponce facility which minimize exposure to subsurface gas. The secure landfill cells will not be utilized for the disposal of municipal wastes. The facility is in a rural setting, thus there are few residences in the area. If gases are produced, they cannot migrate off-site along underground lines since there are none which leave the site. The leachate collection lines are connected to the surface by riser pipes, allowing venting to the atmosphere. The sanitary landfill on the northeast corner is a source of subsurface gas. It is operated as a separate and distinct unit and has no connection to the leachate collection lines for the proposed secure cells.

6.4.2 Design and Operation Features

Hazardous wastes have not been received for placement in the secure cells at this time. When disposal operations commence, no municipal wastes will be placed in the secure cells. A gas vent system has been designed and will be installed when the cover is put in place. As described in Section 2.4, this system will vent gases to the atmosphere.

6.5 Potential for Human Exposure via Soil

6.5.1 Design and Operation Features

The secure landfill cells at the Ponce facility have been designed to minimize the possibility for exposure to contaminated soils. The cells have a system of natural and synthetic liners which contain all hazardous wastes within the cell. Even the cap maintains this double liner design (Refer to Section D, Volume 3 of the May 1984 Permit Application). The facility is located in a rural area with few residences in the immediate vicinity of the site, thus reducing the potential for human exposure.

The secure landfill cells will be operated to minimize human exposure to contaminated soil through the following procedures:

- o Materials arriving at the facility in covered trucks will be unloaded at their appropriate destination by thoroughly trained employees wearing proper protective gear;
- o Materials placed in the landfill will be covered by inert materials and/or soil to prevent prolonged exposure to air;

- o Unauthorized personnel are prevented from entering the site by a security fence and visitors to the site are accompanied by an employee at all times.
- o The tracking of contaminated soils off-site by personnel and waste hauling vehicles will be controlled via proper decontamination procedures. All vehicles will be decontaminated in the truck wash prior to leaving the site. Personnel will be instructed in proper hygiene procedures, including management of contaminated protective gear.

6.5.2 Exposure Due to Off-site Transfer Through Run-off and Wind Dispersal

A. Run-off Control

Run-off from within active cell areas will be controlled by a 4-component drainage and storage system consisting of (1) the Run-off and Leachate Collection System discussed in the Part B application (May 1984), Section D 7.3.2; (2) Run-off and Leachate Containment Tanks discussed in the Part B application (May 1984), Section D 7.4; (3) Leachate Tanks discussed in the Part B application (May 1984), Section D 7.4; and (4) a pipe distribution system to transfer run-off from the active cells to the containment and/or leachate tanks discussed in the Part B Application (May 1984) Section D 7.4. Design of the Run-off Control System has been based on providing containment for 100% of the precipitation from a 25 year, 24 hour storm falling within each cell. Calculations performed to determine volumes are provided in the Part B application

(May 1984) Appendix D. The overall design of the Run-off Control System proposed for the Ponce facility will prevent any off-site migration of soil contaminated with hazardous constituents, under normal weather conditions. The potential for contaminated surface water to run-off site during a severe storm will be minimized via the Stormwater Management Plan, described in Section B, 5.0 in Volume 1, and the Contingency Plan in Section G, Volume 3 of the May 1984 RCRA Permit Application.

B. Wind Dispersal

The potential for wind dispersal under normal weather conditions of hazardous constituents is eliminated through the application of inert cover material to the waste contained in the Landfill.

6.5.3 Operating and Security Procedures

Operating procedures to be employed at the Ponce facility to prevent direct exposure to contaminated soil are as follows:

- o Implementation of the inspection plan (Part B application, May 1984, Section F) to detect potential or actual areas of soil contamination.
- o Implementation of the Contingency Plan (Part B application, May 1984, Section G) to clean-up any areas of contamination therefore preventing migration.

- o Implementation of a Personnel Training Program (Part B application, May 1984, Section H) to properly train employees in the recognition of potential hazards and instruction in proper personal protective measures. Proper employee training will reduce the potential of environmental contamination.

The Security Systems Program proposed for the Ponce facility, which is intended to control site access, is presented in Section F, 1.0 of the Part B Permit Application, May 1984.

6.5.4 Food Chain Contamination

The design and operational items discussed above (6.5.1, 6.5.2 and 6.5.3) will prevent the off-site migration of soil contaminated with hazardous constituents and therefore minimize the potential for food chain contamination.

ATTACHMENT A

A



CARIBBEAN SEA

AUG 06 1985



JOSE LUIS IRIZARRY & ASSOC.

CIVIL ENGINEER LIC. 4420

MARGINAL LA RAMBLA NO 21 2ND FLOOR

PONCE PUERTO RICO

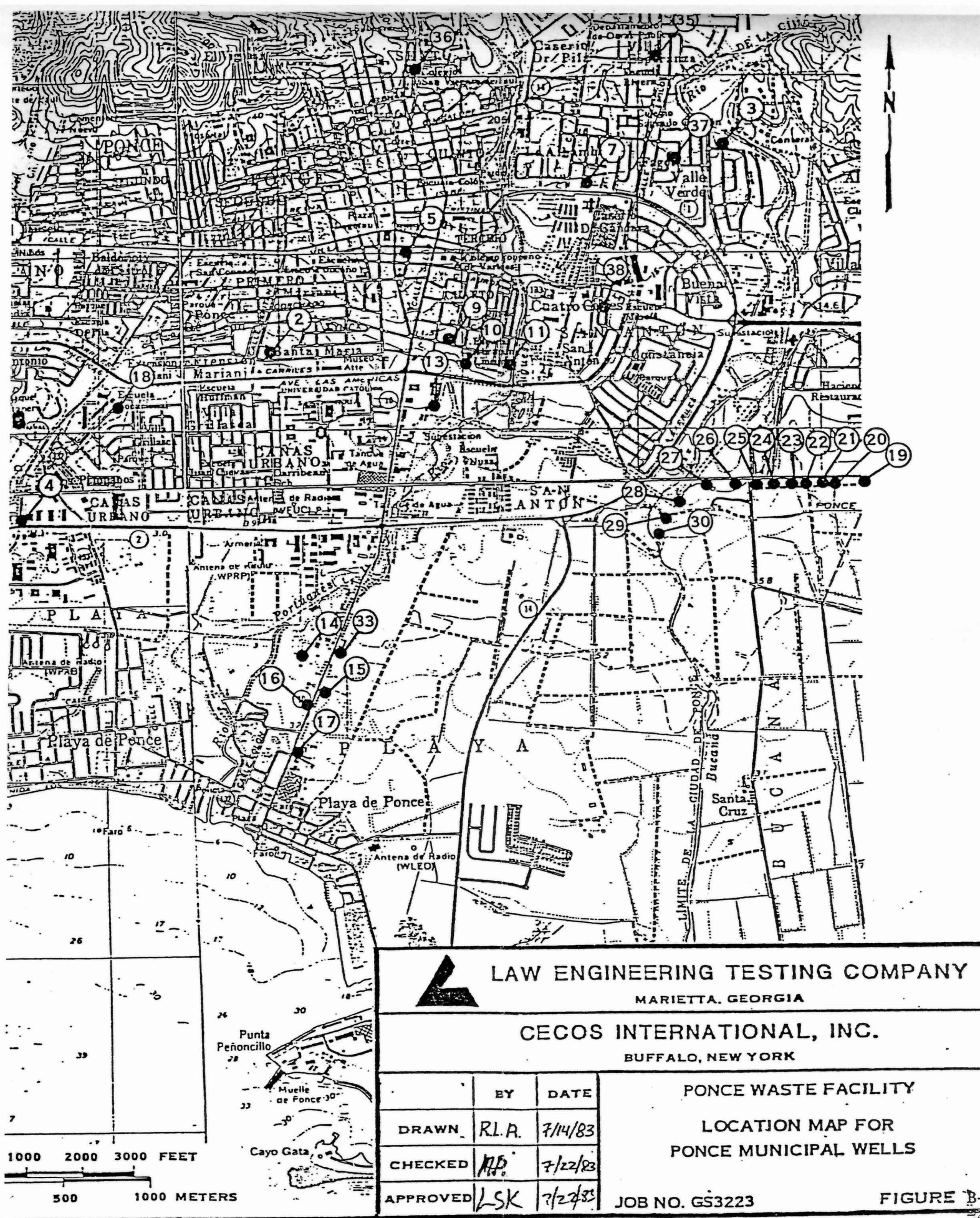
TEL 843-3848



VICINITY MAP

B

ATTACHMENT B



LAW ENGINEERING TESTING COMPANY

MARIETTA, GEORGIA

CECOS INTERNATIONAL, INC.

BUFFALO, NEW YORK

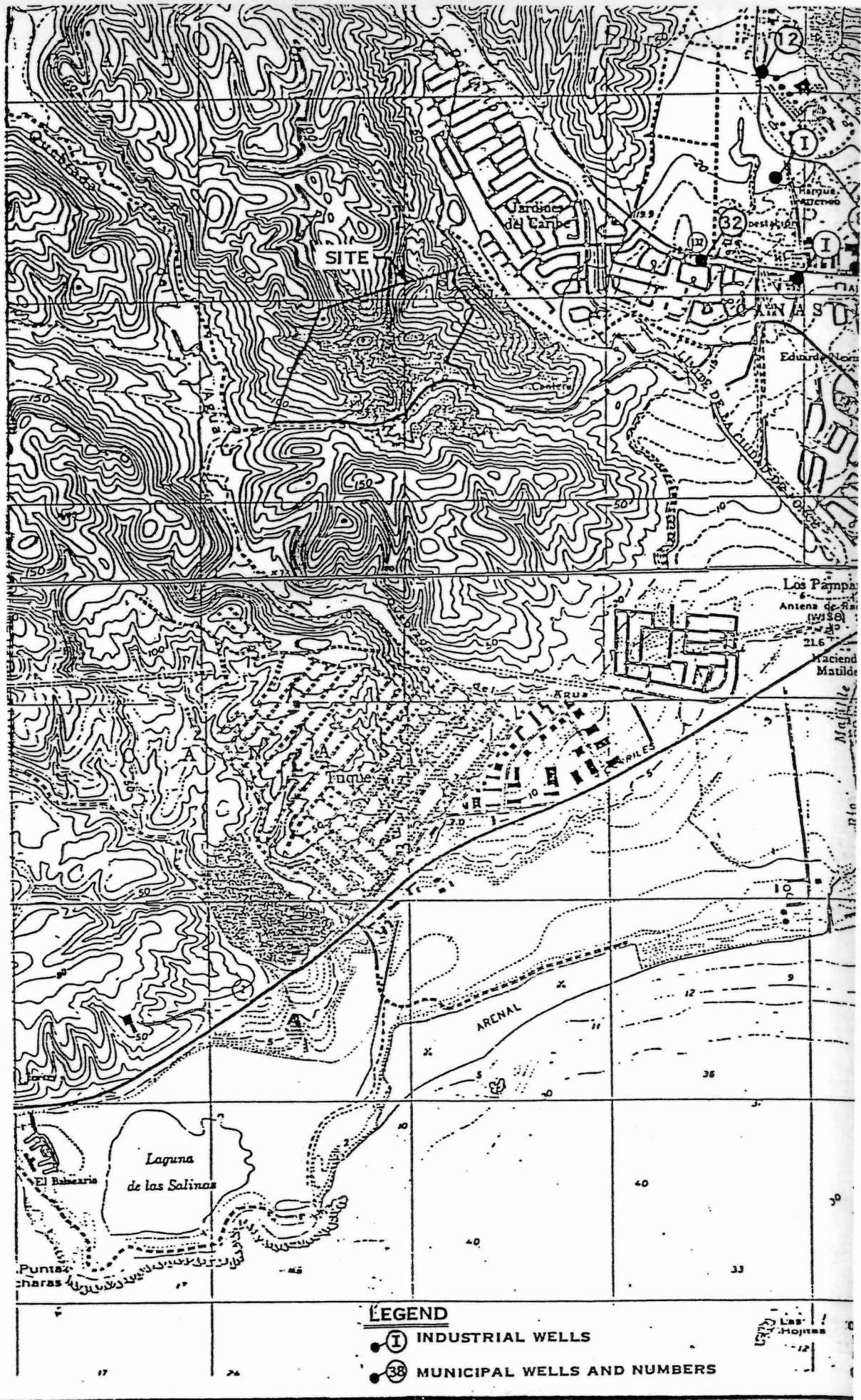
	BY	DATE
DRAWN	RLA	7/14/83
CHECKED	MP	7/22/83
APPROVED	LSK	7/27/83

PONCE WASTE FACILITY

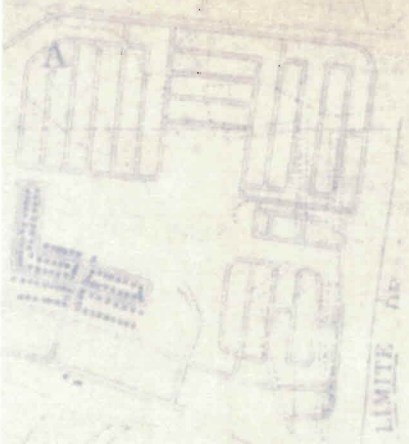
LOCATION MAP FOR
PONCE MUNICIPAL WELLS

JOB NO. GS3223

FIGURE B



ATTACHMENT C



LIMITE AR

CALETA DI

LEGEND

AUG 06 1985

- RIVERS AND STREAMS
- CONTOUR INTERVAL 10 METERS
- ◀ DIRECTION OF FLOW

PONCE CENTER FOR
ENVIRONMENTAL CONTROL

ATTACHMENT C
SURFACE WATER
FEATURES

Project No. 5C475219

D